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Numerical investigation of heat transfer induced by an oscillatory flow within a thermoacoustic engine core[1] KAZUTO KUZUU, SHINYA HASEGAWA, Tokai University — Quantification of heat transfer phenomena in a thermoacoustic engine is a key to the successful improvements in the engine performance. From this point of view, Piccolo and Pistone (*Int. J. Heat Mass Tran. 49 (2006), pp. 1631-1642*) presented a computational method for heat transfer analysis of the thermoacoustic engine. In their method, a time-averaged energy conservation equation is solved for the acoustic field fixed at thermoacoustic engine core, and for simplification, the acoustic field was assumed to be a standing wave. However, the actual thermoacoustic device is often designed so that a travelling wave could be achieved at the engine core part, and furthermore, there are interactions between gas motion and temperature field. The present study proposes a computational model which can consider such interactions and travelling wave. In this model, both the Rott's acoustic approximation equation (*Thermoacoustics, ASA Press, pp.102*) and the time-averaged energy conservation law are simultaneously solved in two-dimensional space. From the results, heat transfer within a thermoacoustic engine core is discussed.

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